UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

In re Application of: Andre S. Chan et al.

Application Number: 10/788,953

Filed: February 26, 2004

For: DATA RECORDING DISK DRIVE WITH NONPLANAR PLATE SURFACES FOR DAMPING OUT-OF-PLANE DISK VIBRATION

Examiner: Watko, Julie Anne

Art Unit: 2627

APPEAL BRIEF

This appeal brief is submitted under 35 U.S.C. §134. This appeal is further to Appellants' Notice of Appeal filed January 4, 2007.

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(1) Real Party in Interest

The real party in interest is Hitachi Global Storage Technologies, Inc.

(2) Related Appeals and Interferences

No other appeals or interferences exist that relate to the present application or appeal.

(3) Status of Claims

Claims 1-5, 10 and 12 are being appealed.

Claims 1-3 stand rejected under 35 U.S.C. 102(e) as being anticipated by Butt et al. (U.S. Patent No. 7,031,104 B1), hereafter referred to as "Butt."

Claims 4-5, 10 and 12 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Butt in view of Machcha et al. (U.S. Patent No. 6,882,501 B2), hereafter referred to as "Machcha."

(4) Status of Amendments

An Amendment after Final Rejection was filed 10/20/2006 and was entered in an Advisory Action dated 10/27/2006. No amendments are outstanding.

(5) Summary of Claimed Subject Matter

Problem addressed by the invention

The invention relates to magnetic recording hard disk drives, and more specifically to disk drives that use damping plates near the rotating disks to reduce vibration. As the disks rotate at high speed (e.g., up to 15,000 RPM), the recording heads, which are supported by arm/suspension assemblies, are moved across the disk surfaces. Air-flow turbulence induced by the rotating disks near the outer perimeter of the disks causes vibration of the arm/suspension assemblies and the attached recording heads and out-of-plane vibration (often called "flutter") of the disks. These vibrations can cause recording head positioning errors and thus errors in reading data from and writing data to the disks.

Disk vibration damping plates are known to address this problem. These damping plates have planar surfaces parallel to the planar surfaces of the disks and extend between the disks near their outer perimeters to encourage laminar air flow and thus a reduction in turbulence.

However, these damping plates also cause high viscous shear forces on the disks, which require a higher spindle-motor torque, and thus higher power consumption, to maintain the desired high rotational speed of the disks.

This invention addresses the problem of reducing the viscous shear forces caused by damping plates without losing the benefit of reduced air-flow turbulence.

Summary of the subject matter of independent claim 1

The subject matter of independent claim 1 is a disk drive that includes a housing (12, 14 in Fig. 3), at least one rotatable disk (for example, disk 64 in Fig. 3), and a damping plate (44 in Fig. 3; 300 in Fig. 6A) fixed to the housing and extending circumferentially around a sector of the disk and radially across a radially outer annular region of the disk. The damping plate has a substantially planar surface (82 in Fig. 3; 302 in Fig. 6A) that faces a disk surface (92 in Fig. 3). The inventive feature, which addresses the problem of high viscous shear forces, is that the planar surface (302 in Fig. 6A) of the damping plate (300 in Fig. 6A) has discrete surface features (306 in Fig. 6A) that are arranged in a pattern of radially-spaced concentric rings, with the surface features in each ring being circumferentially spaced-apart. The arrangement of the discrete surface features in rings results in rings of substantially planar surfaces between the rings of surface features, which reduces the turbulent intensity (page 7, lines 17-20).

Summary of the subject matter of independent claim 4

The subject matter of independent claim 4 is a disk drive like that described above for independent claim 1 with the additional features being that the disk drive includes a stack of disks (62, 64, 66 in Fig. 3) and that the damping plate (44 in Fig. 3) is located between two axially adjacent disks (62, 64 in Fig. 3) in the disk stack. The damping plate has two planar surfaces, each with a pattern of surface features like that described above for independent claim 1, with each planar surface facing a disk surface of one of the two axially-adjacent disks.

(6) Grounds of Rejection to be Reviewed on Appeal

Appellant respectfully traverses the following grounds of rejection and requests that they be reviewed on appeal:

Claims 1-3 stand rejected under 35 U.S.C. 102(e) as being anticipated by Butt.

Claims 4-5, 10 and 12 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Butt in view of Machcha.

(7) Arguments

(a) The rejection of Claim 1 under Section 102(e) as being anticipated by Butt is in error because an element of Appellants' invention is not disclosed in Butt.

Anticipation under 35 USC §102 requires strict identity between the prior art reference and the claim, i.e., the prior art reference must disclose, either expressly or inherently, all of the elements and limitations of the claim. *Rapoport v. Dement*, 254 F.3d 1053, 1057, 59 USPQ2d 1215 (Fed. Cir. 2001) is but one example of numerous citations stating this well-established rule.

The element of Claim 1 not disclosed by Butt is the following:

"each ring comprising a plurality of circumferentially spaced-apart surface features"

The "circumferentially spaced-apart surface features" in "each ring" are items 306 in Figs. 6A-6B.

The erroneous application of Butt is reprinted below from the Advisory Action, wherein the bold-italicized portion is the objectionable interpretation:

> Butt et al explicitly teach "channels 204 concentrated in one or more portions of an inner surface of the base" (see col. 8, lines 20-21). Butt et al further teach "channels 204 concentrated in one or more portions of the inner surface of the base 180" (see col. 8, lines 60-64). ***It is clear that such "portions" are circumferentially spaced apart portions, insofar as Butt et al show that a "plurality of arcuate channels 158 are located upstream of the actuator arm 50" (see col. 7, lines 32-33), that "channels 158 are located downstream of the actuator arm 50" (see col. 7, lines 33-34), and that "channels 158 are located roughly midway between the upstream side of the actuator arm 50 and the downstream side of the actuator arm 50" (see col. 7, lines 35-37).*** The Examiner believes that these teachings together would fairly result in anticipation of the new limitation in independent claim 1. *(emphasis added)*

The above-quoted basis for the assertion that Butt teaches the "circumferentially spaced-apart surface features" is in clear violation of the "strict identity" test for anticipation.

Strict identity means not merely that every element and limitation of the claim can be found in a single prior art reference, but that those elements in the prior art reference are "arranged as in the claim". *Brown v. 3M,* 265 F.3d 1349, 1351, 60 USPQ2d 1375 (Fed. Cir. 2001). In this case the examiner has picked an element from three independent and alternative embodiments disclosed in Butt and combined them to arrive at the claimed element.

The above bold-italicized portion from the Advisory Action refers to "channels 158", which are shown in Fig. 5D of Butt. The objectionable interpretation of Butt is that channels 158 are located in three discrete circumferential locations, thereby apparently reading on Appellants' "discrete circumferentially spaced-apart surface features". However, Butt teaches that these are three distinct alternative embodiments. In col. 7, lines 29-37, Butt states:

> In ***one embodiment***, the plurality of arcuate channels 158 are on the cover 150 so that when the cover 150 is affixed to the base 30, the plurality of arcuate channels 158 are located upstream of the actuator arm 50. ***In other embodiments***, the channels 158 are located downstream of the actuator arm 50. ***In another embodiment***, the channels 158 are located roughly midway between the upstream side of the actuator arm 50 and the downstream side of the actuator arm 50. *(emphasis added)*

The bold-italicized portions in the immediately-above quotation were conveniently omitted from the quotation of Butt that appears in the Advisory Action. Thus the rejection is based on selecting a single feature from three distinct alternative embodiments of Butt and combining those features. These three separate elements of Butt are clearly *not* "arranged as in the claim". *Brown v. 3M, supra.*

The Examiner has thus engaged in "picking, choosing, and combining various disclosures not directly related to each other", a technique like that which was deemed improper in *In re Arkley,* 455 F.2d 586, 172 USPQ 524 (CCPA 1972). In that case the Patent Office combined (1) a specific example of a C-type precursor of the claimed compound, (2) a general teaching of how to convert cephalosporin C-type into cephalosporin C_A-type, and (3) a general statement that compounds with the C_A nucleus have better antibacterial effect than those with the C nucleus. The CCPA held this to be improper and stated the general rule as follows:

> Thus, for the instant rejection under 35 U.S.C. § 102(e) to have been proper, the Flynn reference must clearly and unequivocally disclose the claimed compound or direct those skilled in the art to the compound without *any* need for picking, choosing, and

> combining various disclosures not directly related to each other by the teachings of the cited reference. Such picking and choosing may be entirely proper in the making of a 103, obviousness rejection, where the applicant must be afforded an opportunity to rebut with objective evidence any inference of obviousness which may arise from the *similarity* of the subject matter which he claims to the prior art, but it has no place in the making of a 102 anticipation rejection. *In re Arkley, supra* at 587.

More importantly, even if the examiner's combination of these three alternative embodiments were proper, the basis for the combination is made on an erroneous interpretation of Butt. This erroneous interpretation is the following statement in the Advisory Action:

> Butt et al explicitly teach "channels 204 concentrated in ***one or more portions*** of an inner surface of the base" (see col. 8, lines 20-21). Butt et al further teach "channels 204 concentrated in ***one or more portions*** of the inner surface of the base 180" (see col. 8, lines 60-64). ***It is clear that such "portions" are circumferentially spaced apart portions*** … *(emphasis added)*

It is clear that the "one or more portions" referred to in Butt are *not* "circumferentially spaced-apart portions." Rather, they are *radially* spaced-apart portions. The quoted language from Butt (col. 8, lines 20-21) refers to Fig. 5A. Fig. 5A has an "outer portion 94" and a "middle portion 98" (col. 5, line 63 to col. 6, line 7). These are clearly *radial* portions. Thus, the assertion that Butt teaches one or more "circumferentially spaced-apart portions" , which is the basis for the combination of the three alternative embodiments, is clearly erroneous.

(b) <u>The rejection of Claim 1 under Section 102(e) as being a "mere relocation of parts" is not supported by Butt and is based on the examiner's erroneous interpretation of Butt.</u>

The Section 102(e) rejection in the Advisory Action further states:

> However, even if these teachings together did not result in anticipation of independent claim 1, there would be no invention in relocating known parts, when the operation of the apparatus were not modified by the relocation. *In re Japikse,* 181 F.2d 1019, 86 USPQ 70 (CCPA 1950).

This maxim is not applicable here. The "parts" of Butt are radially-spaced continuous arcuate channels. There is no teaching in Butt that a continuous arcuate channel can be a plurality of circumferentially-spaced channels. Just where did Appellants relocate these "parts"? It is clear that there is no mere relocation of these arcuate channels because Appellants' "parts" are

rings, with each ring being "discrete circumferentially spaced-apart surface features". The maxim can only be applied by relying on the above-described erroneous interpretation of Butt, namely that the "one or more portions" of Butt are circumferentially spaced-apart portions.

(c) The rejection of Claim 4 under Section 103(a) over Butt in view of Machcha fails to state a *prima facie* case of obviousness.

As explained in the preceding sections, Butt does not teach that for which it is asserted and thus fails as a primary reference. Thus a *prima facie* case of obviousness has not been established.

For the reasons stated above, all the claims presently on file in the present application are in condition for allowance, and such action is respectfully requested.

Respectfully submitted,

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APPENDIX A
CLAIMS APPENDIX

1. A data recording disk drive comprising:

a housing;

at least one disk rotatable about an axis of rotation;

a motor attached to the housing for rotating the disk;

a plate fixed to the housing, the plate extending circumferentially around a sector of the disk and radially across a radially outer annular region of the disk, the plate having a substantially planar surface facing a disk surface, said plate surface having a plurality of discrete surface features arranged in a pattern of radially-spaced concentric rings, each ring comprising a plurality of discrete circumferentially spaced-apart surface features.

2. The disk drive of claim 1 wherein there is only one disk, wherein the housing includes a base, the motor and disk being mounted on the base, and wherein the plate is part of the base and said plate surface faces the bottom surface of the disk.

3. The disk drive of claim 1 wherein there is only one disk, wherein the housing includes a base, the motor and disk being mounted on the base, and wherein the plate is part of the cover and said plate surface faces the top surface of the disk.

4. A data recording disk drive comprising:

a housing;

a rotatable stack of disks axially spaced along a common axis of rotation;

a motor attached to the housing for rotating the disk stack;

a plate fixed to the housing and located between two axially adjacent disks, the plate extending circumferentially around a sector of the two disks and radially across a radially outer annular region of the two disks, the plate having a substantially planar first surface facing a surface of a first disk and a substantially planar second surface facing a surface of the second disk, said first and second plate surfaces each having a plurality of discrete surface features arranged in a pattern of radially-spaced concentric rings, each ring comprising a plurality of discrete circumferentially spaced-apart surface features.

5. The disk drive of claim 4 further comprising a plurality of plates, each plate being located between a different set of two axially adjacent disks.

10. The disk drive of claim 4 wherein the surface features are dimples.

12. The disk drive of claim 4 wherein the surface features are bumps.

APPENDIX B
EVIDENCE

None

APPENDIX C
RELATED PROCEEDINGS

None